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EXPERIMENTAL PSYCHOLOGY AND MEDICINE

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I

At a time when both medicine and psychology are subjects of public concern and discussion, and the objects of unusual official attention, it seems important to those in whom both lines of endeavor converge to take stock of their common ground. To the psychologist in medicine who can see no good reason for denying either parent, the lack of an effective working rapport between the two stands out as a deficiency that is almost as unintelligible as it is impressive. There is much more in the respective fields of psychology and the medical sciences that is mutual than mutually exclusive; for in them we see groups of differently prepared individuals engaged in contributing to a study of the same thing, the *person*. It is just as true that there are unmistakably fundamental differences in the specific problems with which those in each field concern themselves, in their modes of approach, and in the respective backgrounds from which they come. These basic differences ensure the necessary degree of independence to make the contributions of one supplementary to those of the other, and therefore additive instead of merely repetitive. As one who was led to preface medical study and training with several years' work in psychology, I am yielding to the temptation to express myself on controversial material as seen from within both palisades.

The chief difficulty seems to stem from a lack of mutual understanding between medical men and psychologists, concerning each other's field, which prevents any effective interchange of scientific concepts, attitudes, and experimental results in mutually related studies. In part, this can definitely be ascribed to the bewilderment which recent upheavals in psychological theory have produced in those who have watched from without. To those who have been able to follow its development from within, the last turbulent decade or two have revealed genetic progress and a certain order. But to the spectator, whose attention is naturally held by superficial movements and apparently sudden shifts of orientation, the succession of events on the psychological scene gives an impression only of chaos,—

like a football game to a foreigner. In part, the difficulty grows out of the lack among medical men of a workable orientation toward psychology which leaves them, faced by the great volume of psychological output, without the necessary guiding principles that would render it accessible. On the other side of the question it is true that, while medicine really embraces an even greater variety of subject-matter and method, it presents to the psychologist a problem in orientation that is greatly simplified by its having been split up more or less arbitrarily into parts,—anatomy, physiology and biochemistry, pharmacology, pathology and bacteriology, and the clinical branches. Nevertheless, just as among medical men psychology is often regarded as completely alien to their studies, there is a persistent tendency among psychologists to look upon medicine as something quite distinct and apart,—as a calling, instead of as a part of biology.

II

Fundamentally the study of medicine is the study of human biology; only its practical applications set it apart as the *profession* of medicine. As human biology the medical sciences attempt to lay a broad and firm foundation for the study of human beings, their development and their structure, gross and minute, the functioning of tissues and of organs within systems, and systems within whole organisms, and the variations those structures and functions undergo with changes inside and outside the organism. The most important contribution of the medical sciences to psychology is thus that of delineating the living frame within which everyone concerning himself with the study of persons must work.

The time has long since passed when any serious student of man could regard the human being as a collection of viscera. The physiologist, no less than the internist and the surgeon, is dealing with complete organisms, with individuals. His task is, however, that of defining the interaction of organismic systems and, within those systems, determining the role played by the activities of parts under controlled conditions. The functional anatomists and pathologists, the pharmacologists and the biochemists, represent coordinate variations on the same general theme and for the sake of brevity will be included implicitly in what follows. In all of the so-called "pre-clinical" sciences, instrumentation in connection with living organisms and with their part-functions has been highly developed with a corresponding perfection of experimental accuracy. These divisions of

human biology are "pre-clinical" only in terms of the medical student's course. To the psychologist they constitute a complete unit in themselves from which he has been able to borrow with benefit, and to which he has much himself of use to contribute.

The physiologist is psychology's closest relative, because the focus of his interest is primarily upon normal functioning. He investigates the person particularly as the organism seen from *within*. In the study of normal variations of normal organismic activity, his question is, *What is going on in there that accounts for what I am observing?* He is more expert than anyone else in dealing with the organism's internal environment, the conditions of its changes and the effects upon the organism itself of these changes. It is entirely incorrect to characterize physiology as the study simply of part-functions; it would be very naïve to imagine the physiologist as overlooking or ignoring the interaction and interdependence of the tissues, organs and systems within the organism he studies. As a matter of fact, nowhere else can one obtain better insight into the inter-systemic operation of the whole individual active than in physiology. It is for this reason that there is today a growing field of common interest between physiology and psychology; before one leaves off, the other begins. The problem that remains is almost solely one of clearing the way for the mutual utilization of common property and the assimilation by each of what is relevant and reasonably sound in the other.

The modern internist and the modern surgeon of the universities and foundations are also primarily specialists in human biology, but somewhat more as naturalists who must deal with their subject as they find him, in his natural habitat. They are primarily concerned with unmistakable deviations from normal functions and from the normal variations of function. Their chief goal lies in restoration toward normality, if necessary by altering the individual through interference of some sort, and at whatever level of organization seems to offer the most promising foothold. This may be at the tissue level or at the organ level, at the level of system interaction, or at the person level where one enters the domain of the psychologist and the psychiatrist. When normal functioning of the person reappears, their interest decreases. In their clinical work attention is divided about equally between viscus and individual, between part-function or system-function, and person-function. In every major problem of the thoughtful clinician two fundamental questions arise, *What can be done about this condition we find?* and, *How will this person react (considering his person-organization and his environ-*

ment-organization) to what we do or to what we leave undone? In many clinical situations the question of the person-function, the way the person reacts, may far outweigh all other consideration for the internist. Likewise, the surgeon knows, for example, that the same necessary operative procedure under the same circumstances may be, for one person the start of a new life, and for another the beginning of life-long invalidism. The latter is not merely an organic but an organismic disturbance. More than this, it is an organismic disturbance at the level of person-function, i. e., at the psychological level, and it must be met by the surgeon at that level. In a similar way, in other situations, the same therapeutic procedure on the part of internist or surgeon may be interpreted by the patient either as a beneficial intervention or as an unwarranted assault upon his integrity as a person.

What, then, has clinical medicine to contribute to psychology? A great deal. The physician in his relationship with human beings is in an unique position, in which he is privileged to share highly personal matters in a highly impersonal way. He has learned to combine deep interest with complete disinterest, so that in time he comes to be able to deal intimately with human problems and situations without becoming himself involved or entangled in them. This gives him the opportunity and the responsibility of observing human behavior and the interplay of human experience as it occurs naturally, often without distortion or disguise. Such special experience can be instructive and enlightening as ordinary experience seldom is, and as laboratory contacts almost never are. The person the clinician sees is, in one sense, not quite the one we experiment upon in the psychological laboratory. He is much less predictable and much more difficult to delineate and define. He is more of a person and less of an instrument.

The clinician's emergencies are life-and-death affairs. The fears he deals with are very real, the sorrows are deep and lasting sorrows, and the defeats are often final and irrevocable. They are not the consequences of put-up jobs which can be accurately timed and prearranged, as laboratory situations are. In the laboratories we have the privilege of being able to focus our attention on one facet of the person at a time, but the clinician usually has to study all facets at once. His experiments are for the most part nature's experiments and their outcome, however definite and characteristic for him, very often cannot be expressed simply in numbers and diagrams. He develops, therefore, the easy tolerance of the naturalist for variability

and unreliability in his material that would be out of place in laboratory procedure. He tends to take sides, in an impersonal kind of way, and so his interpretations are apt to show scientific judgment that is tempered a little with human kindness. His view of man, as a result of all this, is less clean-cut and broader; it is naturalistic and in that sense does fuller justice to the person in his human social habitat, however much it may lose in calculating precision.

III

Psychology today has become a study of man rather than of mind, a study of *persons*, how they act and think and feel. The psychologist deals with the activity of individual organisms, as the internist, the surgeon, and the physiologist do; it is his accent that is different. The accent in psychology is primarily upon function at the person-level and the level of inter-person function, that is, upon the activities of individual persons and the interaction between persons. It is dependent upon physiological and biochemical function in the same sense that these ultimately are dependent upon the functioning of molecules and atoms and of subatomic systems. The interpretation and investigation of the functioning of physiological systems do not necessarily gain in clarity when analyzed into the activities within constituent atoms; and there is a region in such reduction where the term "physiological" definitely ceases to be applicable. There is a region in the process of successive analysis of person function, similarly, in which activity of the person merges into inter-systemic activity, and the term "psychological" can no longer be applied. Systemic interactions can usually be taken for granted by the psychologist and accepted on the physiologist's terms.

Psychology represents a sphere of emphasis distinguished by a specialization of attitude, of scientific method, and of subject matter. The subject matter is in a certain sense unique, for psychology carries on the only organized study of the everyday activities of ordinary men, women and children that is being made. It is the science of the forgotten man. For the psychologist the biography of the individual, his present status and the dynamics of the situation represent the chief determining factors. His fundamental question as he faces the person is, *What is going on in this person and in his surroundings, and what has gone on before, that account for what I am observing?* What the development of the present illness is, what the past history and family history together are to a medical record, the biography

of the person is to a psychological investigation. And what the internal physicochemical environment of the organism at any time is to the physiologist, the dynamic structure of the external environment, physical and social, is to the psychologist.

The fundamental task of psychology is thus that of endeavoring to test, verify, confute, organize and systematize what is known and what is supposed to be known about man at the person level. Its basic work, like that of botany and geology, is to bring order and control into the study of what is familiar to everyone,—in botany, plants; in geology, rocks; in psychology, human beings. The materials of these studies surround us everywhere and they always have, but until someone made them his special business their organization remained in a very simple and superficial state. Plants were for eating, decorating or covering; rocks were for throwing, building or fashioning into tools; human beings were for working, mating or fighting. Plants and rocks each are found to make up complex and intricate worlds of their own, and human beings likewise are found not to be completely understood just because they are familiar objects. Before the psychologist organized his world the intensive study of man was left to the intuition of the occasional genius; but the work of novelists and dramatists bears to the psychologist's work the same sort of relation that landscape painting bears to the photographic survey and the uses made of it. Each does something the other cannot. Beginning with the observation, recording and critical organization of human actions and interaction, the psychologist has gone on to their analysis, in one direction into part-functions of the person, and in the other direction into part-factors of the situation which is interacting with the person. The introduction of adequate controls, the development of a detached attitude, the application of instrumentation and the construction of workable hypotheses have resulted in the production of a scientific structure that is at once well-founded and fruitful.

What can psychology contribute to medicine that medicine will find useful and important? This question is difficult to answer only because of the abundance of valid material with which one is faced. What is often quite freely referred to by critics as confusion in psychology is very definitely profusion, and the wheat is plentiful. To the psychologist who is immersed in it, the field is rich and productive. To the medical scientist, it is at once overwhelming and relatively inaccessible. This is an important obstacle to a more effective rapprochement between psychology and medicine. There is

no reason, except perhaps for the inevitable drudgery and the mutual forbearance it would entail, why the really sound and verifiable material of general psychological research should not be worked over together by psychologists and medical men, and in such a way as to render the result of their conjoint activity more attractive mutually and more useful practically to the medical scientist, the experimental psychologist and the clinician. The task would be an arduous one. It would demand the exercise of an intelligent selectivity in organizing and presenting acceptably the significant data, and whatever hypotheses are really indispensable, in a manner that would presuppose familiarity with what the medical man is in a position to use. It might then become a matter of mutual concern as to what possibilities developed for the joint extension of such research in an effective way. In another direction, that of the experimental setting, there are possibilities for medicine already available.

In his own field of research the psychologist has been faced with special obstacles comparable with those the clinician must meet in his work with the experiments nature sets up for him. Because of the importance of retaining as much of the natural situation as possible, it is very difficult to control and to regulate psychological material under laboratory conditions. This is especially true of the suggestive and distracting influence of the experimenter himself, which constitutes a continual source of possible serious error in studying person functioning, against which the psychologist has had constantly to be on guard. It has been necessary to concentrate to an unusual degree on the dynamics of situations, to standardize them for each experiment and to vary the particular components in such a way that one could study their specific effects in the general constellation. The psychologist has had to develop the capacity for anticipating the interference of special factors in the stimulus situation and has had to perfect a special technique for avoiding or cancelling their effects without destroying too much of the person's spontaneity and thus limiting his potentialities for response. This has been accomplished over a period of many decades and through a tremendous expenditure of time and effort. It has resulted in a system of techniques for reducing or including the results of interfering factors that is quite comparable in effectiveness with the techniques of experimental bacteriology or of the surgical team.

One cannot at times help being impressed with the need in medical experimentation and clinical procedures, whenever the person function or inter-person function dominates the situation, for control of

these very factors. Every clinical man has experienced the interference and the distortion of experimental and clinical results by such psychological factors as distraction, suggestion, fatigue, anticipation, unfamiliarity, successive failures and successes, encouragement and criticism, cooperation, loyalties, preferences and aversions, fundamental wide differences in temperament, in adaptability, in trustfulness and reliability, and the variations in the philosophies of acceptance and revolt. There are seldom set up, however, rigidly controlled experimental situations to give such modifying influences, interferences and distortions definitive expression. In clinical medicine the consequences of experimentation bring a heavy responsibility to the experimenter, and it is very difficult in a clinical atmosphere to maintain anything like the degree of detachment one needs for psychological experiment. The problem here is simply this, How can medicine utilize the specialization of attitude, of training, and of scientific methods that psychologists are able to bring to these and kindred problems?

IV

The potential value of psychology to medicine will be more generally recognized when each has succeeded in understanding the other's needs and attitudes in connection with the study of man. So far, the recognition by medical men of the potentialities of men trained as experimental psychologists has led them to engage only the talent of individuals who happen to have special interest or ability in a specific direction. Thus there is to be found today (quite apart from the multitude of psychometrists and other technical assistants) fully trained experimental psychologists working in conjunction with orthopedic surgeons, otologists, ophthalmologists, psychiatrists, neurosurgeons and pediatricians. This evidence of a new and growing harmony is quite encouraging. It testifies to a rather widely scattered, if not quite widespread, recognition that psychology definitely has something to contribute to human biology and its applications. Unfortunately this mode of development cannot lead to a really effective rapprochement that will have any very permanent results. It is disorganizing so far as psychology is concerned, and it leads to the separation and isolation of the individual worker from the scientific companionship and the atmosphere out of which his potentialities for special contribution arose.

When any experimental science becomes the handmaiden of another or of the applied arts it gradually loses its identity and with

this the special values which led to its being engaged for service. This fact accounts for the *persistence* of departments and laboratories, in medicine and out of it, devoted to the so-called "pure" sciences. The psychologist detached from his colleagues and their mutual laboratories usually cannot maintain his full scientific value, unless he becomes something else. His value as experimental psychologist derives in part from his specific training in attitude, in method, in interpretation and in the type of problem with which he has become at home. It derives equally, however, from his continuous association with colleagues having a similar background, from his detachment from continual contact with more practical interests, and not least from his free and natural association with the study of man in the social sciences and the humanities. The development of small semi-autonomous psychological units in medical divisions leads with growth to administrative duplication of material, equipment, personnel and even of effort.

The solution leads in the direction of utilizing the facilities and the personnel already at hand in the laboratories of experimental psychology. The work of which these organizations are capable is neither trivial nor irrelevant to the medical man. Their studies of the activity of normal persons constitute a contribution that cannot be duplicated elsewhere in the academic structure. The growing rapprochement with some of the preclinical sciences has already resulted in cooperative work in problems of mutual concern. A generous cross-fertilization between physiology and experimental psychology is already in process. Its further development and its extension to the rest of human biology will depend upon the degree to which each is able to recognize the sincerity and the competence of the other in his own field, and the importance and relevancy of the other's field to his own and to the science of man in general.